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***Managing Director***

March 21, 2006

Ms. Anne Stausboll  
Interim Chief Investment Officer  
California Public Employees' Retirement System  
400 P Street, Suite 3492  
Sacramento, CA 95814

Re: Internal Currency Team

Dear Anne,

Wilshire has conducted a review of the internal currency team's personnel, investment process, and resources. This review was conducted as part of Wilshire's contractual requirement to periodically review all of the internal asset management functions, and included an on-site visit by Andrew Junkin and me on February 10, 2006. Overall, we are pleased with the quality of the personnel, systems, and processes, and believe that the Investment Committee should continue to support this internal team.

There are three functions provided by the internal currency team, and this letter will serve as our review of each. We have also included a multi-page table at the end of this review which is similar to what we would complete for an external manager, detailing our opinion on specific aspects of the currency program.

It is important to bear in mind that the internal currency team is acting only in an execution capacity at the present time. Staff has been given discretion to vary the hedge ratio plus or minus 5 percentage points from the target hedge ratio of 25%. However, at this time, Staff has not exercised that discretion and is working on models to use when deciding when to vary the hedge ratio for a particular currency and to what degree. Therefore, unlike other asset classes like such as Fixed Income or Real Estate where the Investment Staff is making active investment decisions, or in Global Equities, where some portfolios are actively managed by Staff, the currency group is only implementing the passive hedge and spot market execution of trades that facilitate the foreign currency activities of other asset classes. As a result, our review of the CalPERS currency group is largely focused on the trading and execution process. In the event that the Investment Committee approves the funding of an internal actively managed currency portfolio, Wilshire will conduct further due diligence on the models that will be employed in managing the portfolio.

## **Summary of Conclusions**

As will be outlined in the sections that follow, we believe that the Passive Currency Overlay portfolio is being managed in a cost-effective manner and in a way consistent with the direction from the Investment Committee. We also found that Staff has been able to add value through the internal execution of foreign exchange transactions for other asset classes, and should be encouraged to continue to execute such transactions wherever possible. Finally, we also reviewed CalPERS' policies that apply to these portfolios, and we believe that they are in compliance.

### **Passive Currency Overlay**

CalPERS' internal currency team provides a currency overlay to partially hedge the foreign currency exposure in the portfolio. The Investment Committee has determined that the proper hedge ratio is 25% of foreign exposure, but allows the internal team to vary the hedge ratio by +/- 5% based on their prediction of future exchange rate movements that will result from current fundamentals. To date, the currency team has not deviated from the 25% target, although it is developing predictive models that will enable it to do so in the near future. Such models are discussed below in the section that deals with the proposed alpha-generating strategies.

As part of our review, we witnessed a demonstration of how CalPERS' Staff calculates its currency exposure, calculates the required hedge amounts, solicits bids from third-party commercial banks and investment banks, selects counter-parties, executes trades, and reviews results. We also discussed with Staff any future improvements that they may have for the investment process and the investment philosophy that will underlie any future fluctuation from the 25% hedge ratio, as allowed by the Investment Committee.

In short, we believe Staff has sufficient resources at its disposal, including a custom-designed (by an external third-party) currency management and trading platform, to achieve the program's goals. Furthermore, we believe Staff has exhibited a high degree of diligence to reduce transactions costs and achieve best execution. Given that Staff selected the trading and management platform in a competitive process, which resulted in full customization of all software to CalPERS' specific needs, we believe that Staff is using high quality technology systems that are appropriate for the currency team's operations. Additionally, we believe that Staff is soliciting bids from a sufficiently wide array of counterparties to ensure that all CalPERS currency trades are executed without significant market impact or transaction costs. Staff currently solicits bids from 9 currency dealers, and has the technological capacity to expand this number if Staff believes that other dealers should be included in their process. Our review of the list of dealers indicated that many of the top banks and brokers are working with CalPERS' team, or could be added to CalPERS' trading platform in the event that their costs and execution become competitive with the current list of available counterparties.

Our review revealed that Staff is clearly committed to distributing its trades among a wide variety of counterparties, and is careful not to execute all of its transactions through a small number of dealers, thereby maximizing the amount of liquidity available to CalPERS. At first, this seemed counter-intuitive to us. After all, if one dealer is willing to consistently offer lower fees or better execution, it would make sense that the dealer should win the lion's share of CalPERS' currency trades. However, as Staff explained to us, the danger in such a scenario is that PERS will become too dependent on a single dealer, and may fail to maintain a broad relationship base with other dealers. In the event that the main counterparty became less competitive in the future, Staff may find that it is unable to change to another dealer.

Instead, Staff rewards the better bidders with larger trades and more trades, and reserves smaller trades for less competitive bidders, while making sure that all trades are well-distributed across all 9 dealers. Staff also directly provides feedback to dealers who are less successful in winning a sizeable share of CalPERS' business in an effort to encourage them to bid more aggressively in the future. We believe that this concerted effort to include all dealers and provide feedback to the dealers will help to prevent Staff from being held "hostage" in the future by a single dealer who becomes less competitive, will help provide ongoing liquidity for CalPERS' internal currency transactions, and will help to continue to reduce transactions costs over time.

As a result of this review, we continue to be confident in the ability of CalPERS' Staff to execute the passive currency hedge program in a cost-effective manner.

### **Internal Spot Currency Execution**

CalPERS conducts a large number of foreign currency transactions when making investments overseas, especially in the Real Estate and AIM programs. In years past, the execution of foreign exchange transactions from CalPERS' US dollar cash positions to the currency of the acquired asset were handled by third parties. A few years ago, CalPERS' internal currency Staff began offering its services to other asset classes to minimize execution costs. As a result, as part of our review, we also discussed this internal function and its effectiveness.

We believe that CalPERS has sufficient Staff and expertise to conduct the current volume of foreign exchange transactions required by other asset class SIOs, and would encourage Staff to conduct all foreign exchange possible through the internal program.

Our rationale for this recommendation are simple – execution and costs. Over the last few years, CalPERS' Staff has conducted a little over 200 foreign exchange trades on behalf of other asset classes, with a notional amount of under \$2BN. In the grand scheme of things, this is probably one of the few areas where CalPERS would *not* be a large customer for a transacting bank, especially if those trades had been distributed to a

number of banks. When such a smaller or occasional client uses a third-party for spot foreign currency exchange, the bank usually executes the trade as quickly as possible in order to maximize trading volume. As a result, that client is usually subjected to the extremes of the current bid/ask spread. Adding insult to injury, some of CalPERS' former counterparties also charge a large per-trade service fee. Finally, such trades are usually conducted quickly and without complete regard for market impact. As CalPERS' own internal research shows, such "agency" trades usually rank in the bottom 10% to 20% of all currency trades when measured on the basis of total cost (explicit costs and market impact). These implicit and explicit costs are often overlooked by personnel in other asset classes, since the currency conversion is a "back office function" and is not central to the investment decision and process.

In contrast, CalPERS' internal Staff has found that their total cost of executing foreign exchange transactions on an agency basis for other asset classes ranks slightly better than the median currency trade, and has resulted in substantial total savings. The results of this study were presented to the Investment Committee at the March meeting.

Wilshire believes that the differences in cost and execution effectiveness are a result of incentives. Third-parties, like banks, are rewarded on the basis of transaction volume, and have a substantial incentive to execute as many client transactions as possible, regardless of cost or market impact. Since most currency transactions by other asset classes are periodic activities, there is no mechanism in place for them to effectively reward or punish counterparties for good or bad execution.

In contrast, CalPERS' internal currency team is rewarded for minimizing cost on every trade and for adding value to the total fund. With sufficient notice (usually at least a few days), Staff can wait for the right market conditions to effect transactions with as little market impact as possible. As a result, Staff will usually parcel out a trade for as long as possible, seeking to capitalize on periodic fluctuations in exchange rates. Instead of just jumping into the market, pushing prices up or down, Staff will usually slowly trade even smaller transactions over a period of days, seeking to outperform the average exchange rate over the period. While this may occasionally result in a higher cost on the few trades in which the currency's price is moving rapidly, over time this type of slow and patient approach will result on average in reduced transaction costs, reduced market impact, and superior pricing than reliance on a third-party who is compensated on the basis of trade volume.

As a result of both the logical benefits of slow and careful trading, as well as the demonstrated value-added in spot transactions by the currency team, we believe that Staff has demonstrated the ability to execute spot market transactions on behalf of other asset classes in a superior manner to third-parties, and we encourage CalPERS to take advantage of this internal function wherever possible.

## **Active Currency Management**

Over the last few years, Wilshire has met with Staff on multiple occasions to review Staff's plans for internal active management of currency as a way to add value to the total fund. Although Wilshire has not been a proponent of active currency management throughout its history, recent meetings with both Staff and some external managers have begun to convince us of the possibility of generating value over time through active currency management. A primary cause of this profit potential is the inherent inefficiencies in the currency market due to the existence of non-profit-maximizing investors such as central banks and large multi-national corporations seeking to hedge exposure. To the extent that a profit-maximizing investor can recognize when the market is being driven by such non-profit-seeking players, investment gains can be made over time.

To be clear, we do not believe that there is an inherent return from simply investing in currency, as there should be in a long-term investment in equities, fixed income, real estate, or a number of other assets. While we expect stocks to generally increase in value over the next decade, we do not see an economic reason why the New Zealand Dollar, for example, should consistently add or lose value relative to the Japanese Yen over that same time frame. Instead, we believe that volatility in interest rates and exchange rates provides an opportunity for profit-maximizing investors to realize trading profits over time.

Since Staff has previously presented its currency management ideas to the Investment Committee, and plans to present more detail over the next few quarters, we will not go into detail here about such plans and models. Although we remain to be fully convinced of the value of active currency management, we encourage Staff to begin a process that will convince us and the Investment Committee of the value of their models. During our meeting with the currency team, we suggested either investing a nominal amount in an active strategy (\$1 million or less would be sufficient to start such a strategy and would have virtually zero impact on the total fund) to establish a track record, or to begin a "paper portfolio" of active currency positions which Wilshire volunteered to monitor if the current regulatory environment makes such a "paper" portfolio impossible to "execute" through a third party. Either way, we believe that it is imperative for the currency team to develop a concrete track record in order to convince us and the Investment Committee of the value of active currency management and the Staff's expertise in managing such a portfolio.

## **Risk Factors**

CalPERS' currency efforts face a variety of risks. Most of these risks are currency-specific and are well known – volatility, liquidity, etc. Wilshire believes that Staff is

monitoring these risks appropriately and has ameliorated many of the currency-specific risks in the portfolio.

However, two of the risks are CalPERS-specific. First, CalPERS has invested in systems and technology to provide the currency team with state of the art tools. However, this should not be viewed as a one-time investment. These tools and systems need to be maintained and upgraded as necessary so that the currency team does not face a competitive disadvantage versus other currency investors. Since currency investing in total is a zero sum game, CalPERS must work to keep its tools and systems up to date. At the present time, we believe that all such systems are current, but it is incumbent upon Staff to monitor the progression of industry technology and upgrade as necessary.

Second, CalPERS, as a governmental organization, faces some organizational risks that for-profit enterprises do not face. For example, non-governmental organizations can induce key employees to stay with the firm by offering ownership in the enterprise. CalPERS cannot match this economic incentive and is more at-risk for losing intellectual capital than a for-profit enterprise would be. This is an ongoing risk for the entire CalPERS organization but is especially meaningful in the currency team given its small size.

## **Conclusion**

In brief, we believe that Staff has demonstrated the ability to both implement the passive currency hedge and to execute cost-effective spot transactions. In addition, we recommend that you encourage the Staff to develop a means to fully explore their theories on the value of currency active management as a precursor for an internal program that may add value to the total portfolio.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Schlachter", with a long horizontal flourish extending to the right.

Michael C. Schlachter, CFA  
Managing Director

## Strategy Evaluation: CalPERS Internal Passive Currency Overlay Strategy

### **Organization (0-100)**

#### **SCORE:**

Ownership/Incentives (0-30)  
    Direct Ownership/Phantom Stock  
    Profit Sharing  
    Performance Bonus  
    Depth of Incentives

Score: 5

Team (0-25)  
    Communication  
Role of Manager, Research, and Operations  
    Longevity of Team

Score: 20

Quality of Key Professionals (0-15)  
    Experience  
    Quality of Leadership  
    Quality of Education

Score: 15

#### **COMMENTS:**

Employees receive performance bonus only.

Team currently is appropriate given size of operation and portfolio. There is a lead portfolio manager and secondary portfolio manager, both of whom are dedicated to currency and international fixed income management. The team members have back-ups from others on the currency team and elsewhere in the trading room. There is also back-up from outside the fixed income unit as members of the equity unit currently handle their own currency trading for the international equity index on a parallel system. Senior members of the team have been together for several years, although some junior members and the global equity "back up" are newer. Communication links are informal and proximity of team members is close.

Education and technical skill set of portfolio managers and SIO-Fixed Income are exceptionally good, by any standard. The portfolio managers and back-ups have traded currencies before with previous employers and between them have more than 40 years of experience. Leadership skill of SIO-Fixed Income is very good and his tenure with CalPERS is the longest of the senior investment staff. This individual has had more than 20 years of internal asset management at CalPERS. Understands risks and issues to be monitored or resolved regarding strategy. Appropriately concerned about process, reporting, and monitoring.

Turnover of Senior Professionals (0-15)  
Low (<10%), Medium (<20%), High (>20%)

Score: 5

Staff turnover for CalPERS is high at both the senior and junior levels, including the departure of 2 CIOs in the last 5 years. Lack of long-term retention incentives lead some staff to consider the organization as a “stepping stone” to better compensation in similar positions elsewhere. Turnover for this strategy is a risk. However, there is excellent back-up with two fully-trained portfolio managers assigned to the strategy, now located in a unit with the longest tenure of internal asset management at CalPERS.

Commitment to Improvement (0-15)  
Clear Mission  
Re-investment  
Process Enhance

Score: 15

Strategy has clear mission and objectives. Resources are sufficient to the current tasks assigned to team, and support exists within the organization to add staff or other resources if strategy expands or other demands warrant.

### **Philosophy/Process (0-100)**

SCORE:

COMMENTS:

Market Anomaly/Inefficiency (0-40)  
Permanent or Temporary  
Clear Identification  
Where and How Add Value  
Empirical or Academic Evidence to Support

Score: 40

The strategy employs a passive overlay approach whose primary objective is to minimize tracking error versus the benchmark. Actual trading results have proven the efficiency of the team and the cost reductions possible.

“Value-added” has also been achieved relative to the average transaction price for currency exchange conducted on an agency basis for other asset classes.

Highest score given as this is a passive portfolio that has met or exceeded its mandate. Future active strategies that seek to exploit inefficiencies or information advantage may receive a different score.

Information (0-15)  
Unique Sources, Unique Processing

Score: 15

Information sources a function of market forces and the selection of dealers for minimizing trading costs. Trade monitoring has allowed for evaluation of the pool of dealers selected for program and proof of concept that internal trading can demonstrate better execution and lower costs than third parties.

Highest score given as this is a passive portfolio that has met or exceeded its mandate. Future active strategies that seek to exploit inefficiencies or information advantage may receive a different score.



Buy/Sell Discipline (0-15)  
Disciplined/Structured Process  
Quantitative and Qualitative Inputs

Score: 15

Portfolio Construction (0-15)  
Benchmark Orientation  
Risk Controls  
Ongoing Monitoring

Score: 15

Quality Control (0-15)  
Return Dispersion  
Performance Attribution  
Performance Consistency  
Style Drift

Score: 15

Buy/sell discipline based solely on underlying index fund portfolio currency exposures and portfolio managers' knowledge of market factors on day of trade. Controlling trading costs during portfolio re-balancing is key and has been clearly demonstrated.

Portfolio construction techniques and monitoring are very good with internally developed and maintained systems. There is a separate monitoring function within the Fixed Income Unit to review this strategy and report separately to the SIO-fixed income. The Strategy has the appropriate policies and procedures on a documented basis in place and a "checklist system" to ensure compliance.

The process has tight risk controls built in, and is independently-monitored within the Unit through a separate reporting line to the SIO-Fixed Income. Within the portfolio management team there is good separation of responsibilities as well as back-up and cross-checks. Further, trade settlement and back-office support is separate from portfolio management. Wilshire has reviewed and had input into the drafting of the procedures manual that covers portfolio management, trading operations systems operations and monitoring. It is very thorough and has been independently reviewed by the SIO-Equity, the SIO-Fixed Income and other CalPERS' investment Staff. The resulting tracking error from the portfolio results has been extremely tight.

### **Resources (0-100)**

#### **SCORE:**

Research (Alpha Generation) (0-40)  
  
Appropriate for Product Style  
Conducted Internally/Externally  
Quantitative/Qualitative  
Sufficient Databases and Models for  
Research  
How are Research Capabilities Enhanced

Score: 38

#### **COMMENTS:**

Research has been conducted internally in accordance with accepted principles for passive currency management. The majority of research has centered in the development of the appropriate systems and trading execution. These have been more than adequately accomplished. Databases of currency movements and prices obtained from outside sources are available to Staff. Current market information is obtained from several counter-parties. Counter-party credit analysis conducted internally by CalPERS' research staff. Counter-party research should continue to be ongoing to ensure the best counter-parties as their capabilities change over time.

Information/Systems Management (0-15)

Ability to Manage Large Flows of Data  
Appropriate Systems for Research and  
Management

Score: 15

Hardware and software support is strong. Currency trading and portfolio management tools were custom-designed to CalPERS' specifications by an external vendor.

The entire industry is grappling with appropriate trading cost execution measurement for currency trading. Staff should remain abreast of developments in these areas and CalPERS should continue to be willing to make the necessary systems investment in this area. This strategy is capable of handling a large volume of assets, with trading costs being the only impediment. Staff has demonstrated an appropriate management of costs and has been able to handle billions of dollars in transactions with existing systems.

Marketing/Administration/Client Service (0-15)

Dedicated and Knowledgeable Group  
Quality of Materials/Presentations of RFPs  
Responsiveness  
Measuring Client Satisfaction

Score: 14

Since marketing and client service are not involved, unlike external sources for such a strategy, full resources of portfolio managers will be devoted to CalPERS, as the portfolio managers will not have to travel to service other clients or market to prospects. End client (Investment Committee) has regular meetings that usually require SIO and Portfolio Manager, but team is able to continue to operate in their absence.

Trading (0-30)

Turnover Relative to Process  
Sophistication of Trading Process  
Measurement of Trading Costs  
Soft Dollars in Client Interest

Score: 25

CalPERS' trading room is very sophisticated, was constructed in the last year, and has subscriptions to all of the most popular trading resources, i.e. Bloomberg, Instinet, ITG, WM, etc. Soft dollars will be used on an on-going basis for data feeds only and their use has been highly acceptable. Relative to the potential assets to be managed the soft dollar use will be quite small. Since the underpinning of this strategy lies in the trading, there have been no significant trading issues that should impact the execution of the strategy. There is sufficient back-up and separation of responsibilities in the trading function. There is ex-post review of trading execution, but as with all trading reviews it can be improved.

***Discussion***

Wilshire's score on this strategy of 84% or 252 out of 300 possible points reflects the strong team and clear success demonstrated at managing the portfolio as charged. This score is an improvement from the 77% score (230 points) that Wilshire provided when the strategy was proposed and managed only in "paper" form. The main reasons for a less-than-perfect score overall are largely due to organizational-level issues such as senior management turnover and lack of retention incentives.